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COOP'S TECHNOLOGY DIGEST

-A Timely Report On The World Of Communications-

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ROBERT B. COOPER, P.O. BOX 330, MANGONUI, FAR NORTH (NEW ZEALAND)

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COOP'S TECHNOLOGY DIGEST

December 10, 1997 ◆ VOLUME 97-10-43

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Holiday Reading

The development of modern telecommunications is resplendent with individuals making major contributions to the science of communicating over distance. Pivotal inventions appearing in a timely fashion have sparked further developments surmounting roadblocks to impeded progress; names such as Armstrong, Baird, DeForest, Farnsworth, and Zworykin leap to the forefront when basic discoveries and invention are catalogued for review. "Broadcasting," the art, science and ultimately business of transmitting information and entertainment to detached and non-interconnected listeners (and later viewers) followed no master blueprint, had no preconceived operating plan, and seldom looked upon itself beyond the end of the current day's schedule. Broadcasting as a scheduled activity had uncertain beginnings which are disputed by historians. Even the definition of what constituted "early broadcasting" is cloaked in disagreement. By many accounts, the first "broadcasting" occurred when someone with curiosity attempted to replace the dots and dashes of Morse Code with either the human voice or music. From the first attempts by Marconi to force "radio waves" to cover distances greater than the human voice (1896), to the first "scheduled" radio "broadcasts" (November 1919), the use of radio as a non-addressed message service was a foggy concept. Forging on Marconi's early experiments, radio was narrowly seen as a potential competitor to wired telegraph (i.e., "narrowcasting"). Radio as a "broadcaster" was not in focus, even following the 1920 experiments by Pittsburgh pioneer Frank Conrad (licensed as KDKA to Westinghouse). As the technology for radio "broadcasting" developed, World War One intervened and the pendulum of radio's development swung away from private ownership of facilities to rigidly regulated government systems. Indeed, even after US military interests were persuaded to "share" radio's reach with private interests following WW1, Great Britain, France and other radio-capable countries rapidly withdrew radio in all forms (including broadcasting) from the public larder.

Radio broadcasting developed first and most rapidly in North America. One company, (the) Radio Corporation of America (RCA) stood in the vanguard of radio broadcasting development. And within RCA, one man rapidly became identified as the "father" of broadcasting. He was David Sarnoff.

Sarnoff in the 30s and 40s attracted as much - perhaps even more - media attention that Rupert Murdoch of the 80s and 90s. Numerous books, thousands of newspaper and magazine articles chronicled his every activity and the achievements of his "team" of scientists and engineers at RCA. RCA quickly created the NBC and later the ABC radio "networks" and around the networks sprang up the foundation for today's modern broadcasting activities. Everything about radio broadcasting had to be "invented" from a blank sheet of paper. Within a decade of KDKA's pioneering news bulletin and musical interlude broadcasts (initially three nights each week, two hours per night), NBC and ABC in America were feeding up to 20 hours per day each of fully sponsored radio programmes coast to coast and even outside of North America via short-wave transmitters. New Zealand, incidentally, did not lag behind

North American developments significantly. The Physics Department of the University of Otago commenced twice weekly, two hour, "gramophone concerts" in 1921; today's station 4XD directly traces its origins to those broadcasts.

Sarnoff's RCA was the direct descendent of an attempt orchestrated by the United States government at the termination of WW1 to exclude "foreign companies" from owning and operating radio transmission facilities on US soil. Radio's value had been proven beyond a doubt during the conflict in Europe and a strong US Navy had managed to assemble virtual control of all radio frequencies and all radio patents under wartime legislation. The Navy wanted to retain these controls and expand upon them when the war ended. Prior to WW1, the British run Marconi Wireless Telegraph Company of America dominated wireless message systems not only in America but world-wide. American firms such as General Electric, Westinghouse and AT&T principally functioned as suppliers to Marconi. The war had created intense nationalistic feelings in America and government departments (such as the US Navy) and privately owned manufacturers (such as Westinghouse and GE) found solace in the common belief that national and international radio communication should not be in "foreign" hands; at least not on American soil.

An impasse developed over how to extract control of radio's technology and systems away from the US Navy's wartime patronage, return it to "private" hands and in the process "kick out Marconi." At the heart of the challenge were hundreds of early patents held by GE, Westinghouse, and AT&T. The US Navy had taken over administration of these patents during the war to simplify rapid design and manufacture of hardware for the war effort. Several Marconi patents were included. Marconi requested the US government "give back" the Marconi radio transmitting facilities which had been confiscated for military use when the US entered World War One, thereby allowing Marconi to resume its monopoly over international radio communications entering or originating in the USA. The Navy was opposed for nationalistic reasons; Westinghouse, GE and AT&T opposed for private business reasons.

In complicated and protracted negotiations, a new firm was created (RCA) which initially had shared ownership of Westinghouse, General Electric and AT&T. The concept was a simplistic solution to a complex problem: Each firm owned key radio patents as did British owned Marconi, which the US government "held" in trust as a result of World War 1. By holding these patents, the government could "assign" applicable patent rights to any firm it wished in support of building equipment for the war effort. Merely returning the patents to their original owners did not seem like a practical solution since the manufacture of (then) modern radio equipment required at least some patents from each of these four firms. A lawyer from General Electric suggested the formation of a new firm (RCA) which would accomplish two objectives:

1) Force Marconi to leave the US market although Marconi would receive compensation for their US assets;

2) Transfer the Marconi assets to newly formed RCA along with making RCA the single firm that would "manage" the patent rights of Westinghouse, General Electric and AT&T.

The US Navy eventually accepted this plan and RCA was formed with the enthusiastic support of the US government. In this one action, "foreign" firm Marconi was taken out of the US radio market and the patents held "in trust" by the Navy Department for the war were returned through RCA to their original holders. RCA and only RCA in effect was the successor to the patent rights collected by the US Navy for wartime purposes.

Holding essentially all of the patents required to produce 1921-modern radio communications equipment, one side effect of this arrangement was that any third party (other than GE, Westinghouse, AT&T) that wished to manufacture radio equipment had to come to RCA for a license for those patents.

That RCA should decide which firms would compete with them in the radio communications market would become a major issue by the 1930s. In fact, although the original plan only involved a pooling of patent rights for North America, RCA lost no time in negotiating similar arrangements with leading firms world-wide. By 1930, if any firm anyplace in the world attempted to produce radio receiving sets without a RCA "pool license" they were charged with violation of international patent rights controlled by the American firm.

Pool right patents were configured in an interesting manner. By 1930 the number of patents affecting radio set production numbered more than 1,000. RCA held virtually all of these in their international pool. New Zealand and Australian manufacturers, like those elsewhere, could only manufacture "radio sets" by signing an agreement to be licensed for the complete "pool" of patents. Individual patents covering one or more necessary elements of a radio set were simply not licensed by RCA. In the pool agreement, the manufacturing firm agreed to two important additional elements:

1) As new patents were added to the pool, they would (with some fee adjustment) be automatically licensed to utilise the new patent additions as well, and,

2) Any patents taken out by the licensee automatically became a part of the pool administered by RCA.

With hundreds of licensees world-wide, it is no wonder the "pool" grew annually by several hundred additions. And as you can quickly see, the pool was self replenishing.

A very small number of radio set manufacturers had been licensed by individual patent holders prior to the RCA "pool scheme." Such licenses were only valid in the name of the original licensee (they could not be transferred even through merger) and these "independent licenses" represented a minor flaw in what was otherwise a perfect scheme by RCA and the other major patent holders. One of the firms to hold such an early license was Zenith, an American firm that through the 1930s and after actually sold more radio receiving sets than RCA.

Over time the RCA pool owners worked diligently to close off these pre-RCA patent licensing agreements. As the technology of radio evolved and virtually all of the newer patents automatically ended up inside of the RCA pool, it became increasingly more difficult to build a modern radio receiver without access to the pool patents.

Zenith went to court (first in 1930, thereafter virtually annually through the 1950s) to battle the RCA patent pool interests. In most of the early court cases, Zenith attacked specific patents held by the pool to attempt proving they were invalid. Zenith, as a major seller of radio (and later television) receivers was more than capable of creating its own original circuits and indeed often led the industry with new improvements. For nearly twenty years Zenith, although often outselling RCA (brand for brand) in radio (and later television) sets, was in comparison a fly attacking an elephant. During some critical years for Zenith, it was spending more than 20% of its annual gross receipts in defending or attacking the RCA patent pool.

The Zenith-RCA battles became even more high stakes as television became a significant factor in the entertainment electronics world late in the 1940s. RCA patents, still administered through the pool now numbered in the tens of thousands. Indeed, RCA had a major segment of its annual budget by the 1950s set aside for research and development in its David Sarnoff Laboratories. RCA, according to records released in court a decade later, was earning in excess of US$200 million per year out of the "patent pool." It is the story of how Zenith, a fly attacking an elephant, finally brought the elephant to its knees that makes our recommended reading list for the holidays.

The title is "The Fall of the U.S. Consumer Electronics Industry" (Quorum Books, ISBN 0-89930-880-5, copyright 1994) and the author is Philip J. Curtis. This book will be found (with some difficulty) in the larger libraries and can be ordered through any competent book seller.

Zenith went to the US Supreme Court on several occasions to gain final enforcement of lower court decisions. In the last and most important case of all, Zenith sought to prove that RCA's David Sarnoff and his top executives conspired to literally sell the American consumer electronics manufacturing industry to the Japanese. Using the patent pool first established in the 1920s, RCA arranged to transfer all of the patents required for the production of radio and television receivers to Japanese interests over a ten year period that began in the 1950s. The Japanese, according to court records, were willing conspirators and while violating US laws regulating the dumping of Japanese electronic products in North America at prices that were significantly lower than the same products were being sold for in Japan, ultimately the US Supreme Court under extraordinary pressure from the White House decided in a narrow decision that "it was in the US national interest to overlook the violations of US law." Zenith repeatedly was able to prove that major Japanese companies were selling TV receivers at 40% or more below their Japan selling price in a giant conspiracy that had the US market losses subsidised by captive market pricing in Japan. Literally billions of dollars in kickbacks were paid to name-brand US merchandising firms (example: Sears Roebuck) who participated in the conspiracy.

"The Fall of the U.S. Consumer Electronics Industry" is about international relations (Japan and the U.S.) being more important to the U.S. political leaders than American jobs. As the production centres for radio, television and other associated consumer electronic items shifted offshore to Japan (and the balance of the Far East) out of the United States, Zenith would ultimately be the last surviving firm still manufacturing consumer electronics in America. The author, Philip J. Curtis, was a attorney employed by Zenith throughout the long, tedious proceedings that stretched over more than thirty years immediately following World War Two. The book is heavily laden with court rulings, memorandums, excerpts from testimony and requires some concentration to follow. But the reward for that concentration is a realisation that even in the United States, the national economy is on occasion moved to a back seat in favour of international relations with a foreign power.

(Another excellent, New Zealand oriented treatment of the early development of radio is "The Golden Age of Radio In The Home" by Aucklander John W. Stokes [Craig Printing Co. Ltd, 67 Tay Street, Invercargill; ISBN 0 473 00389 9, last known impression 1993] . Stokes is a world class technologist with an uncanny recollection for colourful and detailed facts surrounding the development of New Zealand broadcasting after 1923. This book primarily deals with the radio sets, the firms that produced them, and how they were influenced by developments in radio receiver design elsewhere in the world. Golden Age is lavishly accentuated with rare photographs of radio sets produced by firms long gone and forgotten in the New Zealand economy [Collier & Beale Ltd, Radio Corporation of N.Z., Radio Ltd]. Radio receivers until 1938 were freely admitted from foreign sources; after 1938, heavy financial penalties in the form of import restrictions appeared which might have bolstered local production had not World War Two followed so closely.)

(Equally recommended is "The Radio Years" by Patrick Day [Auckland University Press, University of Auckland, Private Bag 92109, Auckland], ISBN 1 86940 094 1 first published in 1994 under the auspices of (the) Broadcasting History Trust. The Radio Years traces the politics of broadcasting in New Zealand, the deliberate attempts by politicians in the 30s and after to eliminate "unfriendly" radio voices which were feared because of their content and the possibility that the words spoken would in some way raise issues deemed non-supportive to the political leaders. By adopting rigid censorship of radio content, and making broadcasters directly answerable for all content broadcast, politicians were in the 1930s able to silence any opposing voices from the airwaves. To further impede the development of "independent" voices, regulations severely limited commercial content took away any possible revenue sources for broadcasters. Over a period of less than a decade, denied access to sponsor funds and prevented from broadcasting any material which did not have advance censor approval, radio broadcasting in New Zealand took on decidedly totalitarian sounds. Where radio in many countries had become a forum of public debate, in New Zealand it became quite the opposite.

In the very earliest of regulations that established censorship, all news, all public discussion concerning matters of current or recent importance were subjected to censorship. And the censors were appointed by the ruling political party of the day. Only a very small modicum of relative free speech was allowed under the censorship laws that prevailed during the 1930s and these were a token recognition that religious services broadcast on radio would be allowed without advance censor approval. Even here there were dangers for the broadcasters. For example, a sermon broadcast by station 4ZP in Invercargill in 1931 raised the topic of Bible use in schools. The licensee of 4ZP was immediately told their authority to operate was under review because the government of the day was discussing Bible use in schools in Parliament at that time. Taking a cue from this stern warning to 4ZP, station 4YA in 1932 used its own power of management censorship to "cut away" from a church service being broadcast when the minister raised the topic of alcohol and how hotel closing times might be affected by the permissible hours of serving alcohol. It may be difficult to appreciate how severely compromised New Zealand broadcasters were by censorship and government restrictions in an era when talkback radio (and television) allows virtually any topic in any voice to be aired to the public.

The Radio Years creates a deep respect for nearly 50 years of less than freedom of speech and free enterprise broadcasting in a country where today's media operates in an environment that is nearly 180 degrees out of synch with the origins of broadcasting. If you do not have this foundation in the background to New Zealand broadcasting, you will be far richer for your present broadcasting after a leisurely read of The Radio Years. And, as a bonus, your knowledge of New Zealand history from the 1920s onwards will be significantly enhanced.)

If David Sarnoff and his RCA "patent pools" dominated virtually every aspect of radio and television receiver production world-wide between 1921 and the late 1960s, no single person since that time has come as close to attracting the Sarnoff level of controversy as Rupert Murdoch. Murdoch's influence in all media (broadcasting of course, television networking, cable and satellite, magazine, book and newspaper publishing)is legendary. Murdoch, the man, now rapidly approaching his 70th birthday, has largely remained an enigma and an unpredictable enigma at that.

In the last 12 months alone he has signed on, off and then on again a plan to take over operational control of the New Zealand Sky Network pay TV service. He has arranged for the financial demise of Australian Galaxy pay TV. He has "invaded" the country of India with pay TV programming resulting in a special session of Parliament that voted emergency legislation to close Indian borders to his products. He has expended tens of millions of dollars attempting to open Chinese borders to his television programming, and to date failed. In America he has teamed with telephone giant MCI to acquire more than US$600 million in satellite frequencies for the planned launch of an America pay TV service, then abruptly merged that operation before it began with existing pay TV operator Echostar, but within 45 days had called off that merger and signed a subsequent deal with cable industry giant TCI and their Primestar pay TV service to merge his original holdings with MCI into the Primestar package.

The "real" Rupert Murdoch is a difficult man to understand, an impossible man to predict, a dangerous man to cross. His rapidly approaching 70th birthday finds him even less predictable and those who work with and for the man are increasingly nervous about not only their own professional positions but the stability of his enterprises.

"Full Disclosure" by former Murdoch employee Andrew Neil (editor of London's Sunday Times, a Murdoch newspaper) is front cover self promoted as, "The most candid and revealing portrait of Rupert Murdoch ever ... ." The book (Macmillan Publishers Limited, London; ISBN 0 333 64682 7; copyright 1996) is, in fact, an autobiography of editor Neil (himself no lightweight in the media business) into and out of which at sporadic intervals Murdoch drifts like a ghost in the night.

Neil stakes claim to putting Murdoch's BSkyB "on the air," but provides precious few details about the challenge or how it was accomplished. He also relates his role as a television "personality" in UK broadcasting which reads largely as a man who used his editorship of a pre-eminent newspaper as a springboard for personal acclaim. In the final stages of their ten year career together, Neil is "drafted" to help Murdoch shift the direction of his American Fox Television Network to a higher plane of intellectual endeavours; an effort that fails before it begins because when push comes to shove Murdoch with perhaps considerable insight realises his network is unlikely to create a worthwhile and profitable news division without placing his more lucrative entertainment divisions at considerable financial risk.

The role of Murdoch through a tumultuous decade of near bankruptcy followed by significant successes in British television and print media in this "story of Andrew Neil" is at best briefly portrayed and at worst recorded as if Rupert was standing off stage whispering commands to an actor who had forgotten his lines. But there are a number of brief insights into Rupert Murdoch - the personality if not the man - which if reasonably accurately portrayed by Neil do help us better understand the Murdoch temperament. It is clear, by Neil's report, that Murdoch is no intellectual heavyweight but he does possess some of the most finely honed street wise instincts for survival on the planet today. According to Neil, when Murdoch begins to lose faith or interest in a trusted lieutenant, he creates elaborate scenarios utilising middlemen to convey his displeasure. Neil's reflections on his final meetings with Murdoch - his employer - strongly accentuates that Murdoch has no taste for personal confrontation at any level beyond paying off the employee and sending him on his way with a "golden parachute." Murdoch's indecision, his propensity to make overnight changes in multi-million and indeed multi-billion dollar "deals" leads the reader to a better understanding of how Murdoch could have drifted through 1997 making and breaking deals with first MCI, then Echostar and finally TCI-Primestar. It is no wonder, based upon the Neil record of working for Murdoch for a decade, that Murdoch's greatest legacy when someone writes his obituary may end up being unfinished litigation in a seeming endless succession of courts world-wide.

Neil hints that Murdoch, approaching 70, may have come to the recent realisation that life is finite and his could terminate soon. For a man whom Neil describes as "self driven" and "always anxious to move on to the next deal" the tangled web he has woven in the world's media and banking circles may already be haunting the Murdoch sense of legacy. Most media people will find "Full Disclosure" a "good read" and have no difficulty knocking off a few dozen pages at a time as the summer holidays allow.

After ten plus years of doing Murdoch's bidding at the highest level of the empire, Neil reports the last words spoken to him by the ageing media baron were:

"Lets keep in close touch; I'd like to be able to call on you whenever I need you."

Indeed, Neil says he never heard from Murdoch again. Which perhaps only indicates that once Neil was out of his life, Murdoch had no further need for the man as he moved on to the next big deal.

RCA's David Sarnoff died a bitter, unhappy man who if Zenith's Philip Curtis can be believed had the final revenge destroying the American consumer electronics industry by selling the American patent pool to the Japanese. Murdoch, as he approaches the same stage in life, will doubtless leave us with his own style of bequeathal which Neil describes as, *"...dealing with a lunatic...*(who is) *a bit irrational* (filled with) *whimsical unpredictability."*

NOTES On The Demise of First Media

There was little fanfare and a surprisingly small amount of interest by the print media when New Zealand Telecom's First Media ("cable television") division quietly announced it was closing up shop. The National Business Review buried the few hundred words it devoted to the closing of a $70 million write-off on page 84 of their November 21st edition. NZ Infotech Weekly assigned the story to a "comment" section which obscured the basic facts in a barrage of personal views from editor Adrienne Perry. The New Zealand Herald headlined "*Telecom praised for biting bullet over cable TV*" in a November 15th story that left readers with the impression Telecom was working on "something better than cable TV" and that it "no longer needed cable TV technology" to increase the (bandwidth) capacity of its twisted pair copper wires. The report flirted with a decade old technology called ADSL as if ADSL would in fact allow transmission of video and high speed data through the existing telephone wires.

CTD first visited the Telecom cable TV project in our second issue (93-09-02). Then we reported:

> *"Every piece of copper wire has a bandwidth limitation; coaxial cable is superior in this regard to a piece of house wiring cable or the fabled 'twisted pair' of the telephone company. But, for a short distance, it is possible to send almost any bandwidth through any piece of wire. You might, for example, transmit Paul Holmes (television programme) through 100 metres of household lamp cable before the significant bandwidth limitations of the cable lowered the picture quality to the point of no longer being a useful picture. And, if you employ some special electronic circuits, along with today's state-of-digital compression, researchers at Bell Labs have demonstrated that a Paul Holmes likeness can be transmitted through POTS (plain old television service - lines) for perhaps 1.6 to 2 kilometres. The magic electronic box that does this amazing feat is built around a technology known as ADSL (Asynchronous Digital Subscriber Line). In computer language, ADSL can process 1.5 Mbits/second which is borderline adequate to allow a modest-motion TV show such as Paul Holmes to run through a short (2km or less) section of POTS. A new generation of ADSL (ADSL-2 or HDSL) promises to process up to 6Mbits/second through a section of POTS (a sporting event such as Rugby with fast motion typically requires 4.6Mbits/second processing speed); field trials of the new (faster) version of ADSL are just starting in New Jersey and New York."*

And that was our state-of-the-art report as of September 1993. An update would read like this:

> *"ADSL-2 is capable of delivering average speeds of 4Mbits/second over twisted pair (copper wire as in old fashioned telephone lines now installed) at distances of 2 kilometres."*

What does this mean in the real world?

ADSL is a digital method of "forcing" wider bandwidth data (compressed digital television, high speed Internet connection) through a couple of kilometres of old fashioned telephone cable. There are trade-offs:

1) For ADSL to work properly, the twisted pair distance from the subscriber termination (telephone instrument) back to the telephone company "server" should not exceed 2 kilometres;

2) Only one digitally compressed video image (with companion sound) can be forced through the circuit at a time. This means the "tuning" (programme selection) common to television viewing must be done at the telephone company server, some distance from the subscriber. "Channel surfing" involves the subscriber communicating with the server and asking that the channel be changed at the server location.

If there are two or more TV receivers in a home, each asking for a different TV programme channel, then the subscriber point would require two (or more - one for each television) telephone circuits between the server and the subscriber premises.

3) To create an ADSL link requires an ADSL "encoder" at the telephone company server and another ADSL "decoder" at the subscriber premise. The cost of these two ADSL units becomes a significant factor in evolutionising an entire telephone subscriber base from the existing POTS service to an ADSL service.

Telecom claims it spent $70 million to install broadband "cable television" (which is actually a hybrid fibre plus coaxial cable network) in front of 65,000 homes (Auckland and Wellington) before it "pulled the plug on cable TV." Simple math tells us this works out to $1,070 per home "passed" by the cable service. NBR's story reported, "Telecom said last week it expected to use asynchronous digital subscriber link (ADSL) technology to send over the existing twisted pair copper wire network services it had expected to deliver over fibre-optic cable."

It is difficult to attach any degree of "corporate honesty" to such a statement. The fibre-optic plus coaxial network has the capacity of delivering terabits of information simultaneously to hundreds of thousands of users. An ADSL link, one from the telephone server to each individual subscriber, is limited to the exceedingly slow megabits per second range (and not very many megabits at that).

Equally misleading is the suggestion that ADSL will prove to be less expensive than a hybrid coaxial cable and fibre network. The benchmark number here is $1,070 per home passed by the hybrid network. To equip each subscriber with two ADSL units (one encoder, one decoder) in today's marketplace carries with it a price tag of more than NZ$7,000. Even the most optimistic projections of declining ADSL unit costs do not break the $1,000 price level before the year 2010. This simply means that twelve years out from now, if the optimistic projections of ADSL costs prove accurate, Telecom could in fact then switch to ADSL at an equivalent cost to today's hybrid cable plus fibre costs. And that overlooks the change in dollar value in the next twelve years (i.e., that $1,070 in today's money will in fact be valued at something less than $1,000 in 2010 money).

It is painfully evident that Telecom pulled the plug on their "cable television" rollout for reasons not reported.

Back To Basics

The primary problem in 1993 was replacing the existing 1920 era twisted copper wires running between each telephone company "substation" and the subscriber premise. In an ideal world, a dedicated fibre optic line would replace a pair of twisted copper wires. Such a fibre optic line would allow gigabits of information to simultaneously flow in both directions; telephone server to home and home to server. Unfortunately the technology to individually connect every telephone subscriber home to the nearest telephone company substation "server" is incredibly expensive to implement. The hybrid coaxial cable-plus fibre option is an intermediate solution offering gigabit information flows with costs more acceptable to securing a financial return for Telecom.

In the telephone industry, this is commonly called "*The last mile problem.*" How, economically, can copper wires be replaced with something that offers greater "bandwidth" without breaking the Telecom bank? Here are the options:

1) Overbuild the existing twisted pair network with:
  a) coaxial cable connected to fibre optic nodes
  b) fibre optic all of the way to the subscriber premises

2) Accept a slower speed network and plan for the eventual day when ADSL technology *might* become available at affordable prices

The downside of this is self evident but not limited to the previous discussion. Add to this that any subscriber premise that requires more than the maximum (2 kilometres today) of twisted pair copper wire to reach the nearest substation "server" will not be reachable with ADSL anyhow.

3) Forget all about any type of wiring (coaxial cable, twisted pair copper or fibre optic) and convert the entire system to radio waves.

Here we reference readers to our report appearing in CTD 97-09-42 (November 5, 1997) where technologist Eric Fien described his vision of the "eventual pathway of telephone firms world-wide." There Fien wrote:

"To make the last mile technology work, there will be a need for tremendous on ground spectrum bandwidths. Certainly the least expensive and fastest way for the on-ground service provider to get broad bandwidths and high speed data functional is to use radio to hop over the twisted pair copper wires that now constrain data speeds. For a tiny fraction of the cost of replacing the present last-mile twisted copper wires, your local network provider could switch to digital spread spectrum radio transmissions to give each home in a 'cell' its own broadband data link (in both directions) to the local or regional hub sites."

Back to the Future

Some might consider it a coincidence. We do not.

On December 8th, using an Internet bidding system, the Ministry of Commerce was scheduled to "auction off" a group of microwave point to point frequencies in New Zealand. The Ministry calls these microwave frequencies "LMDS" and here is what they are all about.

Two bandwidths are being offered; one group is 150 megahertz in bandwidth while another is 500 megahertz in bandwidth. The frequency range of these sizeable assignments is between 26 and 28 gigahertz. Overseas tests (primarily in the US and Canada) with this range of frequencies have proven it is possible to create a two-way broad bandwidth transmission and reception system using these frequencies over individual radio path lengths of up to 10 kilometres.

What becomes practical is for each telephone company to equip each substation "server" site with a package of electronics that transmits and receives within one or more of these frequency blocks. Each subscriber *premise* would then be equipped with the modern day equivalent of a high speed modem plus (radio) transceiver. By communicating with the subscriber premise transceiver through the air, a high speed, wide bandwidth data exchange path is created which simply leapfrogs over the buried-in-the-ground cables of the past. In one technology step, the telephone company bypasses the tedious work and expense of digging up (or burrowing beneath) streets and pavement, leaps over local council objections to traffic impeding construction projects, and in theory arrives at each home with the technical capacity to deliver telephone, Internet and even television. All without wires.

The unknowns? There are several.

8/12/97 - AUCTION POSTPONED TO 26/1/98

First, is Telecom to be one of the serious "bidders" for these newly available microwave frequency blocks? You will know this at about the same time these words are read as the auction results should be posted approximately as this issue of CTD is posted.

Second, even if Telecom shows no bidder interest in this particular group of newly available frequencies, we should not assume there is no master plan by the company to implement (as Eric Fien forecast in CTD for November) an eventual conversion to a last-mile radio-link. Numerous other (not yet offered for auction-sale) frequency blocks exist for this type of usage.

Third, it should be understood that equipment to produce the Telecom required purpose using this frequency range or another are not yet available "off the shelf." This means that even with the frequencies, the very best Telecom (or anyone else) might do with the frequencies is *trial* a "wireless last mile technology" for perhaps two to three years into the future.

Fourth is the increasingly important question of microwave radiation dangers. Public resistance to 900 megahertz cellular telephone sites has grown significantly during the past five years and cell site installers now have a major public relations challenge identifying 900 megahertz transmitter sites which do not raise serious public resistance. On a scale of public health danger. the existing cell telephone network rates a 1 on a scale of 10 (a function of transmitter power, the frequency range in use which is not nearly as "penetrating" as higher microwave frequencies). The 26 - 28 gigahertz region has far shorter wavelengths (i.e., they in theory are far more "penetrating" of human tissue) and in practice a telephone company will require a significantly greater number of 26-28 GHz "cell site transmitter locations" than is currently required for cellular telephone. On a scale of 10, it is too early to categories where this sort of service might fall but there is every indication it could attract even more opposition than cell telephone sites.

Fifth is the matter of security. No matter what the transmission technology employed to connect individual subscribers to substation sites, an entire new industry will spring up around "violation" of the security of the system. Legislation may make it illegal to possess or operate illegal access equipment; that will not stop the curious or the criminal from acquiring the technology necessary to "eavesdrop" on the content of private messages. This is a hazard attached to any radio transmission system. If, in fact, a telephone company also elected to provide "connections" to television and Internet through the same radio links, an ever greater incentive would be created for "piracy" of the services via radio links. The curious (sticky beaks) and the criminal find private conversations of value; a much larger segment of the population finds "pay TV secured by encryption" a worthwhile challenge. So too will Internet hackers once it becomes practical to secure high speed Internet connections through a radio link which by piracy can be tapped by non-subscribers.

Finally there is the matter of costs. There is a benchmark established from the now abandoned First Media plan to roll out a security-secure hybrid fibre and coaxial network of approximately $1,070 per home passed. Costs associated with use of an "LMDS" microwave delivery system are totally unknown simply because the equipment is not yet available and nobody anyplace has built an operating model beyond a test level system.

Eric Fien's closing words in CTD for November said:

> *"There is no new technology here - we are already doing all of these things as stand alone and often competing systems. Only the putting together is waiting in the wings."*

The "putting together" could in fact take five years or more and the final costs will only be known after the putting together is completed. There are significant new directions for technology and the telecommunications industry in this development and a prudent person might remember the (1993) premise of First Media: "*It will solve **all** of our problems*."

TECHNOLOGY BYTES

...BITS and BYTES you may have missed in the rush to make a dollar ...

December 10, 1997 ◆ VOLUME 97-10-43

Satellite TV & Radio

KIBC, Kababayan International Broadcasting Corporation (http://www.kibc.com) is new Filipino broadcaster uplinked from Subic Bay to AsiaSat 2 in MPEG-2 FTA format. Programming is in test mode (3940 / 1210 Vt, Msym 26.655, FEC 3/4) until sometime "near December 15" when full schedule will commence. Basic plan is for 6 hours new each day, repeated four times to fill 24 hour day. Intent of service is to reach Filipinos living outside of country, with particular emphasis on middle east and Asia where it is believed more than a million Filipinos reside and work. The service is encouraging cable, SMATV carriage, claims there are no copyright problems with content "anyplace" because most of the programming is self-created. English will be primary language followed by Filipino.

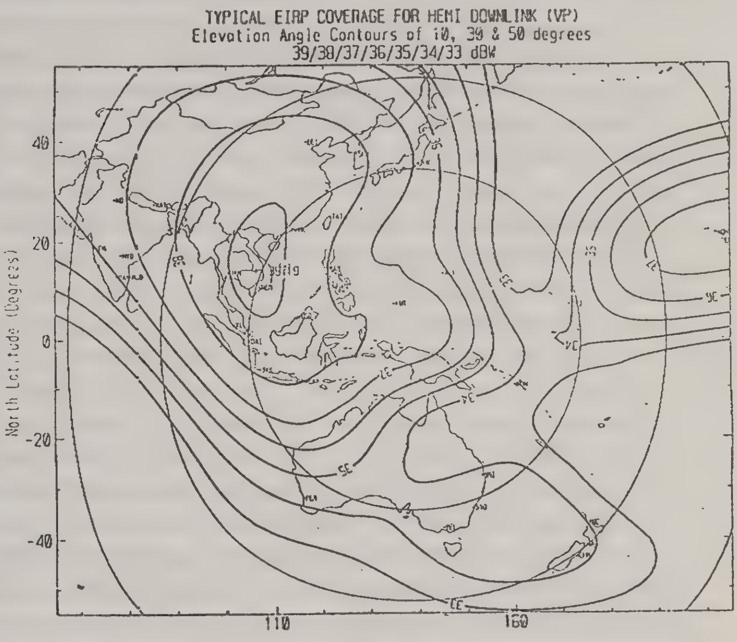
KIBC service (above) shares uplinking facility and digital bouquet with somewhat mysterious "Hallmark Entertainment Network (HEN)." Hallmark is US based firm, offshoot of greeting card company of same name, which owns television rights to several thousand hours of original teleplays. Hallmark was major sponsor / creator of made-for-television drama in USA from 1950s, wisely held onto programming materials and largely kept them out of syndication after initial airplay dates. HEN began distribution using AsiaSat 2 satellite from same Subic Bay uplink facility in August but has attracted virtually no attention to date. Firm's Denver headquarters claims it is aiming at being carried by cable TV and other outlets throughout Asian region, but declines to answers queries from cable operators or broadcasters. New Zealand Sky Network claims they will offer HEN as "second movie channel" in their digital bouquet when Sky becomes fully operational via satellite sometime in mid-1998. Service on As2 has been in FTA (free-to-air) mode but difficult to receive because the digital data stream (which now includes KIBC) is "buried" inside of a larger data stream operated by Kuwait based ZakNet; an Internet one-way service provider (see CTD #42, p. 5). The data stream portion carrying HEN (and now KIBC) ran for several months in non-conventional DVB format with their Solomon Reed function turned off. Some software versions from Hyundai and Nokia would resolve the service subject to unannounced video freeze framing (tiling) which was correctable by switching away from the service and then returning with the IRD remote control. When KIBC was added to the bouquet (late in October), only Hyundai version 2.05 (i.e., older version) software would continue to receive the Hallmark service although the Subic Bay uplink operator remains adamant they have done nothing to the data stream to make HEN less accessible. The KIBC service, in the same bouquet, meanwhile is only resolvable on Hyundai 2.25 (current) version software and on some (but not all) Nokia e3 version software. This is the first known situation where two services in the same bouquet, both claiming to be FTA and both originating at the same source, require two different software versions to play.

AsiaSat 3 satellite, a Hughes HS601HP model with 28 C-band and 16 Ku-band transponders on board, arrived at (Russian) Baikonour launch site in the Republic of Kazakhstan November 28th; is now rescheduled for Proton launch December 23/24. Bird had originally been scheduled for earlier December launch and mid to late January turn on. Under delayed launch, first satellite service from As3 at 105.5E is not likely much before early February. AsiaSat in prepared release reports, "*All AsiaSat 1 customers (presently at 105.5E) will migrate to AsiaSat 3 once successfully commissioned. The new satellite will continue to be used for conventional analogue television and business networks. The additional transponder capacity available will be an ideal platform providing flexibility and higher power for digital television distribution, and for new applications such as delivering multimedia and Internet services in the region.*" As3 is scheduled to "test" (check out of systems) in region of 98E and first test signals, assuming they make the December 23rd launch date, could be expected before January 15th.

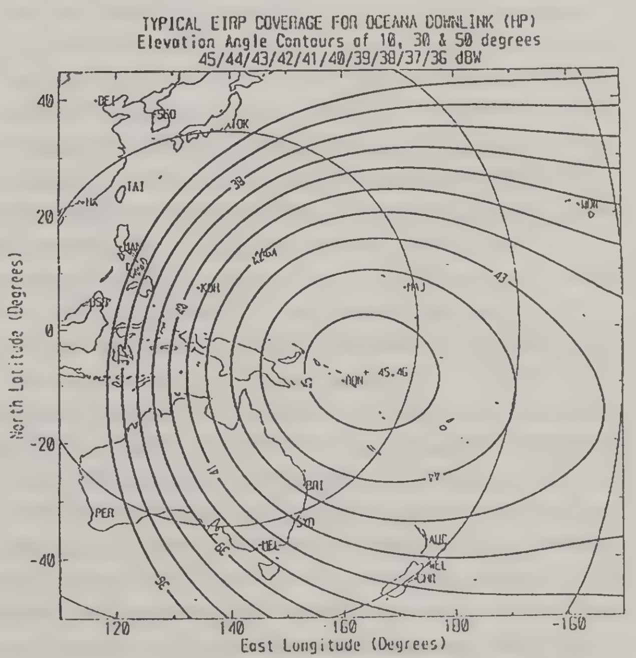
Not good news for anticipators of As3 service. Unconfirmed media report, not verified by Star TV but not denied either, says Star Movie service on As1 4180Vt will cease December 31. Star Movies also running on 3880Hz (As1) and logically one of the two would cease when As3 replaces As1.

Australian regional (RABS/HACBSS) broadcaster GWN (Golden West Network) began preliminary PAS-2 Ku testing (12.263 GHz Vt) December 1. Initial service has been twin channels of colour bar pattern with companion audio tone. Digital parameters are Msym 13.404 and FEC 1/2 at presstime but FEC has already changed once so be aware. GWN still says they will close down present B-MAC analogue feed on Optus before March but that leaves precious little time for Scientific Atlanta receivers to be distributed to estimated 3,500 receive sites presently using the service. Second programme channel is most likely to be used for ABC Western Australia feed; the 13.404 Msym rate selected says they could easily operate four separate video programme streams in future.

Orion 3, scheduled for launch to 139E in the fourth quarter of 1998, has an Australia-New Zealand representative now making the rounds of possible user clients. The satellite will utilise the 3.4 to 3.7 GHz "extended C-band" region to provide 12 transponders with peak on ground eirp's of 34 dBw over New Zealand and eastern Australia, rising to 36 dBw in northern Australia (using both vertical and horizontal polarisation). Orion 3 will also have two transponders capable of providing Ku-band service to "Oceana" which includes New Zealand (40 - 43 dBw) and much of Australia (36-43.5 dBw). Ku signal levels are too low for effective small dish DTH but do uniquely cover region from Hawaii to Melbourne at 40 dBw levels suitable for 1.5m dishes offering opportunity for South Pacific region pay-TV service. (Contact: Dieter K. Streit, 94 Victoria Avenue, Remuera, Auckland tel/fax 64-9-529-0843).


TYPICAL EIRP COVERAGE FOR HEMI DOWNLINK (VP)
Elevation Angle Contours of 10, 30 & 50 degrees
39/38/37/36/35/34/33 dBW
North Latitude (Degrees)
40
20
0
-20
-40
110
160

ORION 3 C-band (top) and Ku (bottom) from 139E


TYPICAL EIRP COVERAGE FOR OCEANA DOWNLINK (HP)
Elevation Angle Contours of 10, 30 & 50 degrees
45/44/43/42/41/40/39/38/37/36 dBW
North Latitude (Degrees)
40
20
0
-20
-40
120
140
160
180
-160
East Longitude (Degrees)
45.46

EMTV (Papua New Guinea0 has finally created the ultimate method of denying their signal to anyone outside of PNG. Actually, inside as well. While the country is wracked with political turmoil and social unrest, and, side effects of El Nino have cut off rain fall so badly that dams have emptied and hydro electric generation has become erratic, EMTV's switch to conditional access progresses. Station announced December 1 switch from PowerVu FTA to CA, advised viewers they would require an SA model 9230 IRD (cost: $1590 kina) and new digital-ready LNB (cost: 90 kina). First hurdle: Nobody in PNG was prepared to stock the equipment and agency (T.E. [P.N.G.] Pty Ltd, Port Moresby; tel 675-325-6322) indicated they would accept orders (and payment) and then place order with SA. Service level from AsiaSat 2 transponder EMTV shares with Australian Sky (racing) Channel is at best marginal even on 3 to 4 metre size dishes in PNG and immediate surround areas (such as Solomon Islands). One report to sister publication SatFACTS from Honiara: "*EMTV signal level on (original) Rimsat when in analogue format was 148. When moving to AsiaSat 2 in analogue, it dropped to 138-142 with constant variations. On digital it reads 129-132 and if there is rain it drops further and totally out on me. Conversely, same As2 the European bouquet sits steady at 149-150 all of the time. Those guys have got some real problems!*"

Satellite programming update (from November 15th edition of SatFACTS Monthly): TVNZ's MTV feed has been moved from 4162 RHC to 3806 RHC on I180 and late in November conditional access was turned on. Ten Network Australia six programme bouquet on I180 RHC (3765) is now using Msym 29.896

"FOR SALE. TELEVISION." (The Sky Network Investment Offer)

A coffee-table quality 36 page (plus cover) full colour booklet released in mid-November offered for sale 49,000,000 newly issued ordinary shares plus 7,500,000 existing shares held by TVNZ in a market range of NZ$2.20 to $2.40 on behalf of New Zealand's pioneer pay television company, Sky Network. Three separate market offerings were made: A New Zealand only, a US only and a "Global" international offering. Following the successful completion of the trio of offerings, Sky NZ anticipated 358,245,785 "ordinary shares" on issue of which new stockholders would own 15%.

The offering booklet brings to light a number of interesting details concerning Sky operations not previously public.

√ **Share buyers are told**, "The returns investors will receive on their investment in Sky will be as a result of any share price appreciation and/or from any dividends paid by the company, although no dividends are expected to be paid in the foreseeable future."

About which, they further warn:

"**It is unlikely** that the company will pay any dividends on its ordinary shares in the foreseeable future because of the expected capital expenditure requirements associated with Sky's planned launch of a digital DBS service. (And) The return investors will receive is NOT fixed or guaranteed. There is NO guarantee that investors will be able to recoup the issue or purchase price of any shares they subscribe for or purchase."

Share subscriptions were in initial minimum blocks of 1,000 (representing an investment of NZ$2,200 to $2,400) with additional shares available in sub-blocks of 200 each.

√ **At the time of the offering**, there was no "established active market" for the shares, and there is the warning, "In the event an active trading market does not develop, shareholders in Sky may not be able to sell their ordinary shares and may be unable to recoup the value of their original investment."

Neither of these warnings is unusual for a new issue, and in fact trading regulations require such statements.

√ **4.2 million ordinary shares** have been set aside for an option plan for "two senior executives." These would be Chief Executive Officer Nate Smith (formerly representing Time Warner interests) and John Fellet (formerly representing TCI). There are restrictions relating to the trading of these (executive officer) equity participation shares. Details of the executive offering are not found in the offering except the notation that the options may not be exercised for two years; the value would be in the initial offering market range of NZ$9.24 to $10.08 million.

√ "**Sky believes that one** of the key elements to its success to date has been its ability to offer its subscribers a strong programming line-up. The company has had considerable success in securing exclusive rights to broadcast many of the most popular sports and movies in New Zealand."

As for this programming, the offering reveals:

"**The Company's sporting line-up** is further strengthened via its exclusive agreement (expiring in August 2002) with International sports programmer, ESPN Inc. Sky has recently obtained the rights to exclusively broadcast ESPN Inc.'s new channel ESPN2. This exclusive right is conditional on Sky launching a separate ESPN branded channel by May 1999."

This simply means that as Sky expands the digital format DBS service it is committed to setting aside an exclusive "ESPN programme channel" within the digital bouquet.

√ **The launch of a digital** programme package is not clearly focused in the offering document. In one place, the existing two programme channels (Orange and Sport) are explained as being temporary, and, "as a part of the Company's strategy this service is expected to be converted during the second half of 1998 to a digital DBS service." The offering says, "Sky has entered into a long-term lease which grants it the right to use three of the eight (Optus B1 satellite) transponders capable of transmitting to New Zealand." About the leases, the offering explains, "**Whilst Sky's current priority** (level with Optus) is the lowest level available it may be able to upgrade its priority level in the future, if this was deemed appropriate, by increasing its annual transponder rental payments."

What this means is that Optus sells transponder space based upon user priority. The user selects the level of priority by deciding how much guarantee they wish from Optus of uninterrupted service. A "lowest level priority" user is the first to be "bumped" (>)

(Sky offering - continues)

in the event a transponder fails on the satellite. If a Sky transponder fails, and Sky is the lowest priority user, Sky is simply out of luck and forced to operate less one of their transponders. If a transponder of a higher priority customer of Optus fails, that higher priority allows the second customer the right to "demand" a replacement transponder from the pool of lower priority customers. About which Sky's offering says:

"**Disruption of the Company's transmissions** from the Optus satellite could, depending upon the nature and the duration of the disruption and the availability of alternate transponders, have an adverse effect on the Company."

√ **Sky's first satellite transponder**, currently in use delivering Sky Sport and Sky Orange in analogue format (along with a recently added TAB radio channel), went into operation in April 1997. The second transponder will be available to Sky in May 1998, the third in June 1999. Sky's offering projects they will begin commercial use of the second transponder "in the second half of 1998" and non-published information (also not verified by CTD) claims an August 1 (1998) target date for the first digital service.

√ **There has been a belief** that Sky would position itself as an exclusively satellite delivered service over some period of time. The precise business plan has not been announced although Sky has told equipment installers and others in the trade of a plan to offer terrestrial TV channels TV1, TV2, TV3 and TV4 via their satellite "bouquet." Sky has never placed this in writing in a public place and will not verify the authenticity of this report. Previous issues of CTD have explored the financial and technical challenges faced by the present commercial terrestrial broadcasters in converting to a digital domain and the "win-win" opportunity available if indeed they do use the Sky digital satellite format to convert from analogue only.

About analogue (UHF) terrestrial operation, Sky writes:

"**Sky's existing UHF service** has wide appeal. The Company believes that it is important to continue to offer a UHF service while it develops its digital DBS service as the ability to offer both UHF and digital DBS services should appeal to a broader range of potential subscribers and should lead to additional growth in subscriber numbers.

"**Following the second transponder** on the Optus satellite becoming available, during the second half of 1998, Sky intends to begin offering a nationwide digital DBS service. It will initially broadcast both analogue and digital DBS whilst Sky installs digital decoders in current analogue DBS subscribers' premises. Once this is completed Sky will cease analogue DBS broadcasts, at which time Sky intends to offer up to 20 digital channels including additional sports and movie channels."

Someplace in this adjustment, an ESPN "branded" channel must be made available (under the ESPN exclusive contract) although not before May 1999. Sky has also announced "The Hallmark Entertainment Network" (channel, primarily made-for-TV movies and TV teleplays) as a second movie channel and Hallmark confirms this agreement. The offering goes on to say:

"**As a part of launching** its DBS service the company intends to re-tier its programme offering. Once Sky's digital DBS service is established the company will seek to migrate its UHF subscribers to its digital DBS service where it believes per subscriber contributions may be higher."

What this is saying is as follows:

1) **The existing** 4.5 channels (5 with TAB) delivered by UHF transmitters is likely to be reconfigured such that after DBS begins some of the present UHF programme channels may carry different programmes than at present (i.e., re-tiering).

2) **Sky would like** to move all subscribers away from the UHF analogue service at some future date because it believes subscribers equipped with digital DBS decoders will spend more money with Sky than those only offered the UHF terrestrial analogue channels. This is logical given that pay per view movies, sport will be included in the digital DBS service but not in the terrestrial analogue service.

To that end, the offering states:

"**Sky believes** its ability to offer up to 30 channels when the third satellite transponder becomes available in 1999 presents significant opportunities to enhance its programming packages and re-tier prices for its services."

Of note, the offering reports the present agreement with TVNZ subsidiary BCL (>)

(Sky offering - continues)

"expires on 30 April 2001." What this means is Sky has a window of opportunity between 1998 and early 2001 to "migrate existing UHF subscribers to its digital DBS service."

Of interest, as gleaned from the offering documents, is the relationships between the original Sky investors and new majority owner INL. Sky notes:

"**INL recently purchased** a 48% shareholding in Sky. Notwithstanding the fact that INL's shareholding will be reduced to approximately 40% following the Global offering, INL will still be Sky's largest shareholder. INL's position as New Zealand's largest print media company may create opportunities for Sky.

"**INL is 49.4% owned** by a wholly owned subsidiary of News Corp. News Corp has significant investments in a number of media and pay television companies including BSkyB, Foxtel, and Star TV. Sky expects to benefit from this global pay television expertise, particularly in enhancing its programming offering and the development of its digital DBS service."

Elsewhere in the offering, some tiny print further elaborates about the relationship between Sky, INL and bankers who hold paper on a $250 million revolving credit facility.

Sky reports the banking agreement says:

1) "**The bank facility** limits Sky's dividends and other distributions to 50% of the company's consolidated free cash flow from continuing operations for the previous fiscal year and prohibits the company from paying dividends..." except under very cumbersome standards.
2) "...**prohibits Sky** from investing or commencing business outside of New Zealand..."
3) (Requires that) "**News Corp continues** to hold at least 35% of Sky's outstanding ordinary shares..."
4) (requires that) "**no other party** (acting alone or in concert) own more ordinary shares than News Corp..."
5) (requires that) "**News Corp retain** effective control over the affairs, policies and governing body of the Company"

Some historical perspective is valuable here. On February 28, 1997 INL announced (using its own Web site), "**The Managing Director of Independent Newspapers Limited, Mr Michael Robson announced today that negotiations for the purchase of a shareholding in the New Zealand pay TV operator, Sky, were at an end.**"

It was one day prior, February 27 (1997) that Sky held a media press review and formally announced their DBS plans.

The Sky offering clearly reports, "In **March 1997**, Sky entered into a $250 million revolving credit facility with a syndicate of five international banks." The curious part.

If the banks require (a) "(that) News Corp continues to hold at least 35% of Sky's outstanding ordinary shares,", and (b) "no other party own more ordinary Sky shares than News Corp", and, (c) "News Corp retain effective control over the affairs, policies and governing body of the Company:"

How was it possible for the five banks to lay down terms **in March** which made Sky's operations subservient to News Corp interests if INL/News Corp called off negotiations to acquire Sky on February 28? And did not reannounce a completion to the negotiations (wherein INL did acquire 48% of Sky) until August 26?

There are several potential disclosure problems here. That Sky might negotiate such an arrangement with the five banks was (at the time) a private matter (as Sky was not publicly traded at the time). That INL as an already public traded company might be implicated in such an arrangement **in March 1997** but did not acknowledge its participation in the various guarantees for Sky until many months later raises concerns on behalf of INL's shareholders.

Sky's public float is a first for pay television in the region. How well Sky does with the initial offering and perhaps more importantly how well Sky does as an operating entity during 1998 and 1999 will have a significant impact on other public floats in our telecommunications world in the future.

(FEC 7/8) with NTSC news feeds on programme channel 5 usually in the clear, Globecast colour bars on programme six also in the clear.

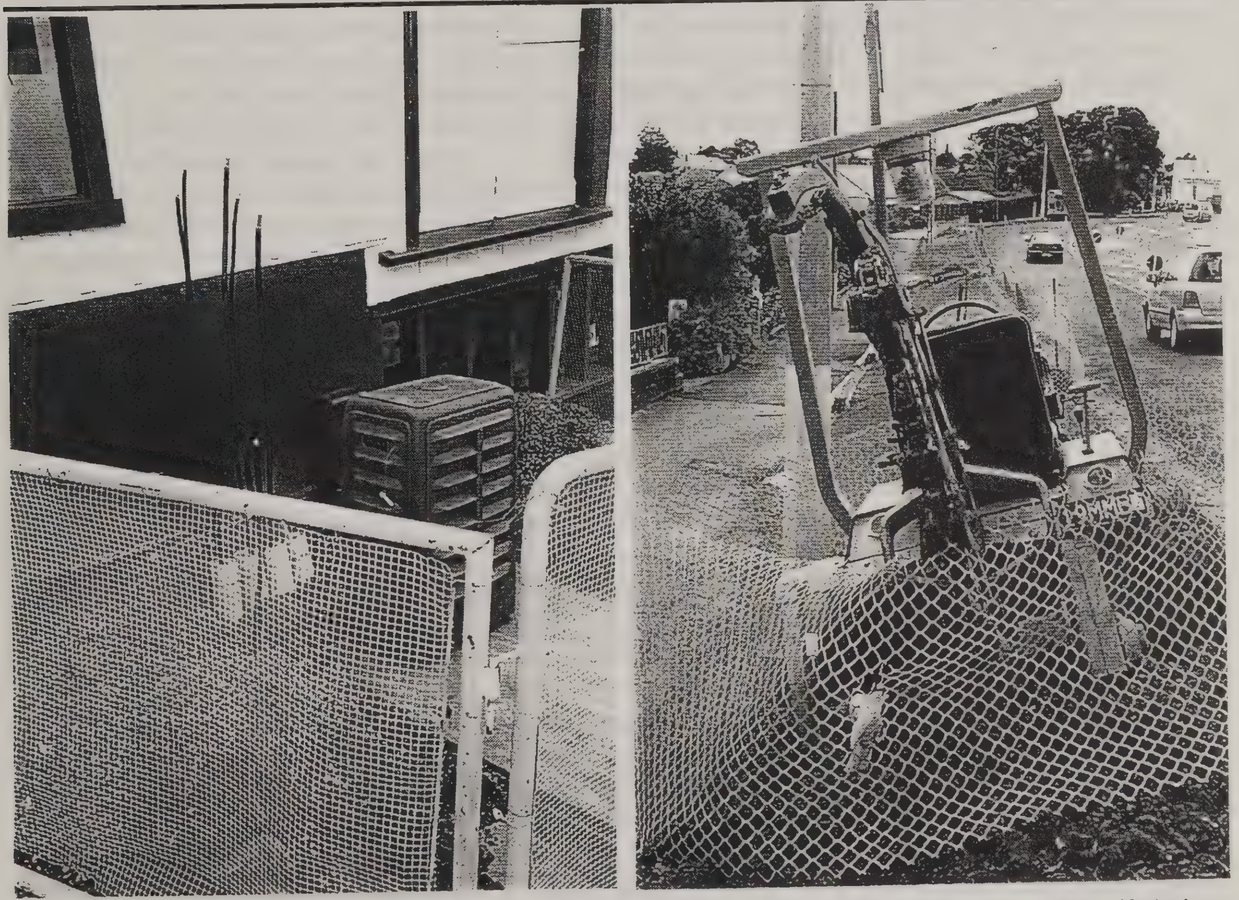
Thai TV5 Global Network reported as either active or planning to be active in MCPC on unknown frequencies on Intelsat 702 Ku (177E) and Intelsat 701 C (180E). There are a couple of unknown (as in not identified) MCPC services at 180E but efforts to unravel them using accepted Nokia receivers as "sniffers" have not revealed any sign of this network service. The press release may in fact be prior to the actual transmission start. Thai TV 5 Global? A Thailand national service recreated for export use. Increasingly, you are not "much of a country these days" if you are not creating an export version television service for world viewing.

US DirecTV has passed benchmark 3 million subscriber mark. Originally, this was to be "break-even" but company now says it will be somewhat larger than 3 million before profits flow.

Echostar continues massive promotions to attract subscribers to DTH "Dish" system but at considerable cost. Latest financials show firm lost US$115.5 million in third quarter alone because of rising cost of selling its service to US$80.4 million in same period. Loss occurred while revenue was rising from $30.4 million in same quarter year ago to US$124.8 million this year. DISH claimed 825,000 subscribers September 30th for quarter rise of 235,000.

Digital TV & Radio

US battle to define precisely what constitutes HDTV continues. Some broadcasters view their recently allocated digital spectrum as more than an opportunity to convert to high definition television. Indeed, at least one US network has openly told affiliates it plans to mix HDTV with multiple programme channels of "MDTV" (medium definition television) and it will encourage affiliates to equip their transmission facilities to handle optionally either or both. US government officials that created the HDTV are aghast at the suggestion that broadcaster spectrum allocations will, in fact, be utilised for anything other that original-stated HDTV purpose. Subject to pressure from government, the fact is that spectrum for digital television could be used by broadcasters for "other purposes." The broadcasters in turn are anxious to preserve their operating options in an environment that is increasingly more complicated and competitive to their long established free to air television



AND THEN THEY QUIT - work left unfinished when New Zealand First Media called off their cable television roll out (see p. 8). Left, six unconnected lengths of hard-line coaxial cable protruding from an excavation in Auckland suburb Remuera; housing to right was slated to cover equipment never installed on the cables. Right, Idled digger, holes in the ground left open, several hundred metres of street-side traffic warning cones. *What is a First Media cable system?* **Thousands of holes in the ground which they poured $70 million into!**

Nothing Graceful About Galaxy/Australis Swan Song

A fresh injection of A$5 million, from regional pay TV operator Austar (see p. 20) has allowed Galaxy/Australis to continue operating until early in January. The firm's largest category of debtors, US based bond holders, have A$587 million riding on the outcome. Galaxy management hopes it can structure some type of rescue deal in the limited time left before it will be forced to close the doors.

What seems to have been largely ignored in all of this to date is the input from the Australian public. We sample public opinion largely gleaned from Internet discussion groups to highlight just how the handling of the Galaxy/Australis matter is being viewed by present and future potential pay TV customers in Australia.

"Let us say that Prof Alan Fels is not very bright. A classic case of a living bore stuffing a new industry up. Happens all of the time in Australia. Too many bureaucrats who have to find something to do so they can see themselves on TV and in the papers. The saga goes on." (19 November)

"What a load of shit. It is obvious Mr. Alan Fels has blood all over the knife he has ripped into the heart of galaxy. If Mr. Fels is so hell bent on seeing competition why not draw some blood at the profit of merchants selling fuel at extremely inflated prices in country areas? Why does Mr Fels seem hell bent on seeing Galaxy die an instant death? It is my belief that he has been told to shut Galaxy down to please Optus who are playing a game of tactics threatening to withdraw from pay TV altogether. Optus are hell bent on getting access to Galaxy's satellite delivery method. Well, if they want to deliver by satellite, they should invest in their own infrastructure." (18 November)

"I know alot of people out there that hate Galaxy which is fine but if you only have Galaxy to choose from you have to take it or watch free to air. After hearing that Galaxy looks doomed, I rang Optus and Foxtel to ask them IF they will be coming to my street (both are 3 streets away at the moment) and I was told by BOTH there will be no more cable roll out. In fact, neither would forecast when or even if they would EVER come to my street! I believe that most of Perth and Adelaide are in the same situation - access only to Galaxy. Looks like a lot of us are doomed to watching the Christmas CRAP that free to air has ready for us. The ACCC is there for the consumers best interest ... well, I for one will be a consumer with no pay TV at all thanks to ACCC. Now that I have said my piece, I will turn on my free to air TV and pass out from boredom." (23 Nov.)

"Foxtel is in my street but they stopped 40 houses away and the construction is not going to be resumed. Why the hell don't the relevant bodies sell satellite licences to ALL pay TV providers and force them to offer universal access? In Europe you aren't stuck with this crazy situation of cabling done in a hodge podge fashion, here but not there, skipping big chunks of homes in the middle of everything. In Europe you just whack up a dish and you're set for any channels you wish to get. Here, even if I got access to Foxtel, I'd still only have access to about half of the total channel universe since Optus has made no moves into Perth at all." (24 November)

"I'll bet that bastard Fels has cable to HIS front door!" (Nov. 24)

"Austar is near me but not available where I live, by cable or satellite. I am going to set up an address inside of their satellite service area, subscribe and bring the equipment 'across the line' into my backyard." (Nov. 26)

"I am in Perth and I have Galaxy. I would change to Foxtel if they would get off their lazy asses to bring it down my street. Our street had cable installed six months ago but they claim there is no signal inside of the cable." (28 Nov.)

"Hey - Foxtel has absolutely no idea even WHERE they do have signal! We live on a corner and the street down the side has signal according to Foxtel. The unreal part - the side street is fed from the street out in front of my house. I am at a loss to figure out how the signal that is not out in front mysteriously is there down the side! I was given a set of address numbers on both streets where the cable is claimed to be ready for service; I checked and there is not even the cable itself in the address ranges given me!" (29 Nov.)

"Is Galaxy really worth $52.75 per month versus $42.95 a month to Foxtel for the SAME channel package?" (28 Nov.)

DVD REPORT from the USA

CTD 97098 (November) devoted two pages to "early adopter experience" with DVD in the South Pacific. DVD is now in nation-wide roll out in the US and here is a report covering those magic shopping days immediately following the American Thanksgiving day from a DVD enthusiast in Oklahoma City.

"Virtually every consumer electronics store, not just the big chains, now offer DVD players and software. At Best Buy (chain store) I saw 5 players sold in a 15 minute period (3 Toshiba, 1 Sony, 1 Panasonic) during the time I was browsing the DVDs for sale. Their player display was quite good with a Toshiba theater wide TV, Toshiba player playing the promotional disc with Golden Eye and Twister excerpts that everyone seems to be playing. In one Best Buy store the discs were disorganised, in metal bins, hard to go through and very sloppy. In a second Best Buy store, DVD had a special area using the same Toshiba TV and player. The discs were in their own aisle, fully alphabetised and they had all of the latest releases. The area was packed with people and included promotional placards for Disney releases coming December 2.

"As an early buyer of DVD, I was quite amazed at the conversations I overheard; people who were between awe struck by the images and disinterested but looking none the less. There is obviously a big education job remaining for the industry, as these sampled comments will illustrate:

'It is a movie that plays through your CD player.'

'All you need is a CD player connected to your A/V receiver and then connected to your TV. It is a CD that plays movies.'

'It is a smaller laserdisc that will play on current laserdisc players.'

'You can record to VHS tape by simply plugging the DVD player through your VCR.'

'Don't get any of that letterbox stuff - it crops off too much of the picture.'

'Yes, it also records TV from your VCR.' "

(PS - None of those statements are correct - ed)

operations. The question of what constitutes HDTV may turn out to be more political rather than technical. There are at least six (perhaps more) different HDTV "formats" available, some require a full TV channel of spectrum space to broadcast a high definition, wide screen image. Others cut technical corners, reduce the amount of bandwidth required in the process, and leave "room" within a TV channel for the transmission of secondary (non-HDTV) programming or data (such as Internet) at the same time. How this argument develops in the USA will ultimately have some impact on the South Pacific as well since spectrum managers in New Zealand and Australia are closely following the example being set in US.

ICs designed specifically for the new HDTV world are beginning to pour in sample quantities from R and D labs world-wide. The market will be in the hundreds of millions of chips for this specialised application in a relatively short period of time. Early entrants include ex-Bell Labs Lucent in partnership with Mitsubishi, another from Motorola-Sarnoff (ex-RCA Labs), third from Intel. Forecasters suggest market for HDTV chips will be in excess of US$700 million by 2002.

Thomson Consumer Electronics has received one-time infusion of US$1.9 billion from French government to help it refinance existing debt of US$2.6 billion. Funding has received necessary approval of European Commission with agreement Thomson will limit its market share in European region to 10% of its total annual sales through at least business year 2000.

Consumer Electronics

With DVD playback industry now off and running (see CTD9709, p. 10), the next technical hurdle facing equipment manufacturers will be DVD-R or a disc system which allows consumers to record (and re-record) video directly to disc as they now do with VHS tape. There are five serious contenders for standardisation, virtually all suffer from relatively modest storage capacity. The belief is that unless discs can record at lengths comparable to today's VHS machines, they will not prove to be a "next generation sales success" with consumers. Improvements in disc storage capacity has been slow to date and in small leaps rather than giant bounds. A 2.1 Gbyte disc system offered by M-DVD uses a 3.5" disc to provide 133 minutes of recording time with S-VHS quality. A Pioneer system, slated for industrial sales during first half of 1998, manages 4.7 Gbyte storage. There is less than unanimous agreement as to what the minimum amount of storage time must be for the product to be successful.

Beatles are now on DVD: A Hard Day's Night and Help! are US$24.95, Magical Mystery Tour US$19.95. Titles have multiple language, subtitle dubbing and Dolby AC-3 audio. Producer MPI plans The Very Best of the Bee Gees, shortly.

20th Century Fox is now denying it will release movie titles on DVD "anytime soon." Firm is major hold out from DVD marketplace.

Panasonic DVD players are being marketed by US retailers with coupon entitling buyer to a free DVD disc when mailed back to company. "Dances With Wolves" is currently being offered in a promotion running through January 31. Additionally, suggested street price for Panasonic DVD-A300 players has been cut $100. Thomson, in competitive move, cut street pricing for RCA-brand RC5500P and ProScan PS8600P $100 each to US$599 and $649. Formal "list" prices were not cut, however. Second generation Panasonic players are scheduled for introduction in January.

Highlights of annual COMDEX show in Las Vegas, late November: Wireless intra-home communication systems using 2.4 GHz frequency band to link PC data to TV sets, PC keyboards to remote PCs. Hitachi sub miniature notebook PC weighing less than 1 kilo; digital still cameras with one megapixel resolution and CMOS image detectors; new LCD display systems no larger than the screen itself; and, handheld PCs with Windows 2.0 CE programme including colour, backlit displays.

VHS tape sales in US may drop this year; a first ever event. World-wide, however, VHS tape sales remain strong largely because of thousands of "piracy copy" duplication outfits in Russia., eastern Europe and China who are consuming tens of millions of blank tapes per annum. Magnetic Media Information Services, a trade association of tape suppliers and distributors in less than enthusiastic USA-1997 report, notes: "*VHS is not immortal.*"

Jump-starting audio Minidisc industry is intent of consortium of Japanese firms who plan major sales and consumer push in USA starting in January. Minidisc format, a product of Sony engineering, has languished as a consumer product from outset. Aiwa, Denon, JVC, Kenwood are joining Sharp and Sony to push system which saw only estimated 250,000 players sold in USA during 1997 (by comparison, new DVD players have topped 300,000 sold). Minidiscs are 2.5" in diameter, have been primarily for portable players until now and discs sell in $12 to $16 range. Approximately 400 music titles are available, all through Sony Music Corporation.

Zenith brand Internet box is being built by Taiwan Acer. Unit has US$299 price tag, uses Advanced Micro Devices x5 133 MHz microprocessor and in USA is automatically linked to Sprynet as Internet service provider ($24.95 per month). Major competitor Thomson set-top unit accesses cable TV only through video output line on TV receiver; Zenith box includes built-in cable TV compatible tuner for direct access to cable as well.

Computer mouse that talks back. FeelIt Mouse from Immersion feeds back messages to user through mouse proper. Mouse communicates by responding to different amounts of pressure, speed of scrolling (for example) through documents is varied by how hard you do (or do not) push down on the mouse. Suggested list price will be US$139.

Sony has recalled 160,000 AA alkaline "Stamina" brand batteries because of reported leaking electrolytic fluid. Production period covers May 1996 through April 1997.

In monthly survey of USAconsumer intention to purchase new TV sets within six months, 5,000 household study found intentions dropping from high of 8.4% in August to low of 5.7% in November. Confusion about how existing-for-sale TV receivers will function in new digital environment still is causing TV set sale problems in North America.

Kodak's world-wide force is being cut by 10,000 jobs in move to reduce mounting losses created by firm's entry into digital camera technology. Kodak's recent business plans have concentrated on recordable CD blanks, digital cameras, thermal printers. Company reports loss of US$100 million on rewriteable CD blanks alone as world price fell from original $3 to under $1. Kodak had constructed new plant to produce the blanks. In traditional business areas, Kodak's world battle with Fuji for film sales and processing has also eroded profits. Fuji film is often 50% less costly than comparable Kodak film and US analysts report while Kodak's market share there is 66%, that is a 4 point loss in one year to Fuji.

Adult cable programmer Spice Entertainment has launched Internet version, claims "full motion video delivery" is at least equal of cable TV delivery technology.

Cable/Fibre/MMDS/Pay TV

Sky Network's public float brochure claims the following growth of satellite delivered two-channel pay TV from April 1 to October 31: As of June 30th - 6,547 residential and 315 commercial installations. As of October 31 - 10,620 residential and 435 commercial customers. Overall, 241,398 subscribers (residential and commercial) as of December 31st and 287,790 as of October 31. Income? For the residential customers $6,903,000 at $650 per home (commercial rates average $100 per week for pubs and clubs and probably totals in excess of $150,000 per month at this point. Also of interest, Sky's offering claims 61 of 74 New Zealand District Councils have notified the company that "dishes of the size (Sky) is currently installing are permitted under their district plans." It has been a matter of some concern that Sky satellite dishes would require land use consents or other bureaucratic approvals on a customer by customer basis.

Galaxy Australis now reports it is prepared to "tough it out" and hopes it can "last two more months" (December, January) by greatly reducing staffing levels and otherwise reducing overheads. The company gave formal approval to proposed merger with Foxtel late in November but approval was perfunctory as Foxtel had withdrawn offer because of objections filed by ACCC agency following protests from Optus. ACCC officials have admitted they were told by Optus officials that if merger went ahead, Optus would not only close down their Optus Vision cable service but would also close down local telephony services - and, admitted this statement from Optus played a "major role" in ACCC decision to attempt to block Foxtel take-over of Galaxy/Australis. Galaxy and programming customer Austar reached agreement announced December 2 where Galaxy will transfer approximately 10,000 Pace IRD units to Austar for nearly A$5 million (A$500 each, slightly below previously quoted 'market price'). The units are described as an "older version of the current version IRD" which Austar could no longer source from Pace. Galaxy's chief executive officer Sean O'Halloran has departed the company which is now being run day to day by an insolvency management consulting firm. Austar operates in non-metropolitan regions of Australia, is significantly owned by American firm UIH (which also owns controlling interest in New Zealand cable operator Saturn). Galaxy claimed this infusion of funds would allow them to continue to operate through the end of December. Galaxy has ceased accepting new subscribers in most areas, most Galaxy offices are reported as "bare walls, floors" with usual office type equipment now gone. In any area where Foxtel cable is available, it is reported anyone ordering Galaxy service is being told they can only have Foxtel cable. For commentary appearing in Australian media, see report p. 18.

Optus may have "forgotten" to advise this fact when trying to convince Australian ACCC chairman Fels of their threat to withdraw from local telephone. The firm has signed a US$100 million commitment with Motorola + Siemens to take equipment which has only one use. That is? To allow cable television systems to also carry local telephone calls.

Time Warner cable in US is nearing completion of plan to transmit approximately half of its total channel line-up from central location to several hundred separate (company owned) cable headends by the middle of 1998. Plan involves common services such as HBO, CNN et al to be merged to MCPC digital streams, sent to satellite via link operated by Time Warner, and then received by cable headends for distribution via digital cable (as a group) or where appropriate converted back to analogue for local analogue delivery. TCI has a similar (HITS - Headend in the sky) operation. Savings will be significant over time, eliminating tens of thousands of individual dish antennas, freeing up often valuable real estate, and reducing amount of equipment required in individual headends. Smaller MSO Adelphia recently launched digital cable to 1.7 million homes served by 25 separate systems. Using TCI HITS, and NextLevel DCT-1000 digital set-top converters, digital service package delivers 17 premium channels and 18 pay per view channels (plus 40 digital radio services) to subscribers.

TCI cable has accelerated schedule to convert systems from one-way to two-way and from analogue to digital transmission standards. Company had cut back capital expenditures in most recent quarter year to US$132 million, plans ramp up starting this quarter to $225 million and further acceleration of spending to cut one year off of original three year conversion schedule for digital and two-way. Cable telephony apparently is major issue with TCI which presently has fewer than 5% of its customers so capable.

A 1993 "raid" on a Montana (USA) ranch suspected of poisoning animals by US government officials has resulted in s US Appeals Court decision of interest. Government officials either invited or allowed news cameras from CNN to "tag along" on the raid. The government had obtained a search warrant. CNN recorded the raid and subsequently aired the story. The rancher claimed his Fourth Amendment (to the US Constitution) rights against unreasonable search were violated by the presence of the news cameras. The court has agreed and a possible US$10m sanction is on the line.

Terrestrial Broadcasting

Auckland's pioneer music video channel, MAX-TV, terminated its broadcasting at midnight December 2nd. A sale of the channel and MAX-TV equipment to Television New Zealand subsidiary BCL was announced. MAX-TV operated in direct competition to Television New Zealand's MTV service which began operation in midwinter as a replacement for the Horizons Network. MAX-TV viewer ratings have never been significant but were typically larger than those earned by TVNZ's MTV. BCL claims they will use the Max frequencies for TVNZ digital TV operations in Auckland and Hamilton. Following close down of MAX-TV, and public announcement of sale to BCL/TVNZ, public outcry jammed Television New Zealand switchboard with irate (and usually four letter word laced) complaints. Viewer response has focused on perception TVNZ, unable to compete with their MTV product, simply bought out MAX to get it off the air. Image of state owned enterprise (SOE) using public funds to shut down competitor will have repercussions not good for the national network.

Seventh USA national TV network,. "Pax Net," is scheduling August 1998 launch. Network already has owned and operated terrestrial stations plus affiliates representing 67.6% of US households; expects to break 80% by launch date. Programming, unlike earlier start-ups Warner Brothers and UPN, will be 24 hours per day from launch using "infomercials" as bread and butter foundation in non-prime time hours. Network is positioning itself for female viewers with programming which it describes as "uplifting." A number of previously network run shows popular with female viewers has been secured for the network (Touched by an Angel, Promised Land, Sisters, Road Home) and original programming in the same vein will also be included. Headquarters for Pax Net is West Palm Beach in Florida, another first as this is out of the major production centres of Hollywood and New York City. Network says it will also be "cable and satellite friendly," does not plan to charge either for programme distribution.

NBC network (USA) is exploring ways of "growing the existing network/affiliate paradigm" to more effectively respond to the evolving broadcast business environment. Network previously announced plan for "coast to coast" network of web sites hosted by network affiliates. Increasing cost of original programming (episodes of ER, for example, have risen to US$10m per episode for first play rights) including sports is at the root of the new plan.

Audience measurement firm Nielsen is rolling out test of new "digital TV environment" viewer measurement technology. With dozens, hundreds of channels on offer to homes metered by company, accurate recording of channels actually viewed has become cumbersome and often error-prone. New Nielsen system, which they say has attracted US$23 million in investment to date, is supposed to eliminate viewer inaccuracies by assigning programme identification code to each programme transmitted by a broadcast network. The code is buried in the video stream (whether digital or analogue) and is invisible to the viewer but read by the newly developed equipment.

Aircraft Owners and Pilots Association is creating a "broad coalition" to fight US federal government ruling that would pre-empt local or regional (state) authorities from stopping the construction of new television towers for digital TV broadcasting. Virtually all of the more than 1,500 TV broadcasting towers in USA must be supplanted by new towers of equal or greater height to afford antenna "hanging space" for the new digital TV channels there. AOPA says it believes the tremendous increase in new broadcast towers is a matter of public (airway) safety, does not believe federal government should have exclusive authority to approve or deny construction applications. Local officials are also opposed to plan and a bill introduced into the US Senate would require local approval before new towers could be constructed.

SPACE Pacific Mark Long Digital and Analogue Training Courses at SPRSCS '98

Trade association SPACE Pacific is sponsoring a pair of personalised training courses during the overall South Pacific Region Satellite & Cable Show event in mid-February at the Far North Cable TV five community cable system in northern New Zealand.

February 17 & 18 / Digital Satellite TV Course

Times: 10AM to 5PM February 17 and 18 (lunch provided)

This course has been designed to include students who may not currently have a solid technical background but who wish or need to understand basic digital technology and are willing to assimilate the necessary information in a step by step fashion.

Course materials (provided) include Digital Satellite TV Installation Handbook, Satellite Installations videotape, specialised course handouts, the Mark Long Asia/Pacific Satellites on Disk (CD) Library, course exams (to be taken post the course and leading to Certification by SPACE Pacific). The cost of the course is US$350 (payable in NZ or Australian dollars at the applicable exchange rate).

February 21 & 22 / Satellite Technician Certification Course (Advanced)

Times: 10AM to 4PM February 21 and 22 (lunch provided)

This course is an intensive overview of all aspects of satellite communications including a highly technical discussion of the parameters of digital signal transmission. Course begins with basic overview of all satellite services including analogue, progresses to digital with emphasis on technology important to individuals involved in uplinking, downlinking, equipment installation and servicing.

Course materials include a copy of the Satellite TVRO Handbook, Satellite TV Technology Overview videotape, supplemental course handouts, and the 1997 World Satellite Almanac. Cost of the course is US$240 (payable in NZ or Australian dollars at the applicable exchange rate).

In between (February 19 and 20) SPRSCS '98 Retreat. Detailed information from (tel) 64-9-406-0651 or (fax) 64-9-406-1083.